As we are relying more and more on data to understand our world, and as problems require global solutions, we need to effectively communicate that data to enable people to make informed decisions.

Visualizations can be effective in showing data, but a single picture alone may be poor to explain and engage an audience in decoding the message.

There are many ways for data-driven storytelling:

One of them being comics.

Though comics are familiar to everyone, they are vastly underexplored for data-driven storytelling.

This comic is about data comics and how to leverage comics to tell stories with data.
Here, we explore data comics as a new genre, inspired by how comics function. Comics are an old art, familiar to many.

Data comics convey information in data, telling a story, and communicating through visualizations.

Examples of data comics started to pave the way...

Four Essential Components of Data Comics

- Visualization
- Flow
- Narration
- Words and pictures

Our goal will be to spot the Island of Data Comics... in the ocean of storytelling.

We believe it is timely to start this journey now. We start exploring different angles, trying to describe what makes it special and what is the potential of data comics.
Data comics are inspired by other visual forms concerned with the presentation of change and sequence:

Realistic

Abstract

While all of these pictures are visualizations, not all of them show data.

Data visualizations provide a visual form to something otherwise invisible.

In fact, data does not actually have to exist, nor can we be sure the representation is true.

A chosen visualization must fit the data, but...

most importantly, it must be understood by readers...

...even those who have never seen a visualization.

Data comics can vary style and detail to support a message...

...or use alternative representations to highlight a different point.

...which eventually will be shown to the audience.

Data visualizations are designed to allow for a variety of discoveries and insights:

Trends

comparisons

distributions, ...

relations

outliers

change

clusters

We call this component visualization, ranging from iconic realistic pictures to abstract and conceptual visualizations.
In storytelling, it is important that people understand the presented content easily.

Even more when data and visualizations are complex.

Yet, comics offer a fascinating and simple way:

We call this component flow, ranging from an undirected non-explicit flow to a directed flow indicated by the order of the panels.

No reading order requires readers to explore by themselves.

Comics can explain complex processes by splitting them into less complex units.

Linear order provides guidance and aids argumentation.

This requires transition.

For example:

For data-to-data:

For visualization-to-visualization:

For moment-to-moment:

For detail-to-detail:

For level-of-detail:

But sometimes, a linear order is not desired or just too simple.

For data-to-data:

For visualization-to-context:

For message-to-message:
Data always has a context.

A good story has a rhythm, it draws readers in, it immerses...

but, most important, it has a message to the world.

Data never comes alone, Context creates story which wants to be narrated.

A good narration requires balance;

it can use different types of narrators:

universal human

visualization

It makes use of transitions between panels and separates the important from the detail.

But storytelling is an old art and learning from the masters... can help to create truly dramatic walkthroughs.

We call this component narration, ranging from factual arrays of visualizations to richly narrated graphic novels.

Factual

Narration

Narrated
The narrative power of comics comes from pictures and words in symbiosis.

Words can be considered the realm of the verbal:
- the logical
- the sequential
- the abstract
- the learnt
- the slow

Pictures can be considered the non-verbal:
- the factual
- the parallel
- the concrete
- the perceived
- the fast

We call this component Word and Picture, ranging from almost entirely verbal, to non-verbal and visual.

Verbal  
| Word and Picture | Non-verbal |

In data comics, pictures are mostly visualizations that show evidence in data.

Pictures can be mere reference to the logic in the words,
or stand-alone where no words are required to convey the intention.*

*Understanding can come from context, but more text may be better than less.

Words can help understand a picture, explaining and telling us what to look at.

Could you figure out which countries are shown?

Data comics embrace both words and pictures to create a better understanding.

A combination can mean associating paragraphs to pictures,
or integrating text into pictures,
or pictures into text.

For example, showing increase or any other pattern in temporal data "...". Others showed soccer games \[\text{[16-20]}\], or the amount of change in data changes in networks and small maps \[\text{[16-20]}\].

Eventually, text can become mere annotations, leaving more space for the visualization and for the observers to explore.
We believe, data comics can lead to engaging visual and narrative artifacts

by combining verbal and visual content, leveraging each one’s strength as well as their synergy;
by delivering one message at a time and creating an explicit guided tour for the observer;
by leveraging the richness of data visualizations to provide visual evidence for facts;
and by allowing to factual visualizations to blend with other styles and types of pictures and narratives,

We wanted to start the discussion, as we believe there is potential in pursuing this journey.

discussing the benefits and limitations, the scenarios, intentions,
and doing the research, fueling the discussion, and exploring the space.

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There are many open questions in exploring this space:

Effectiveness
Visualization Literacy
Design Guidelines
Visualization Integration
Templating
Editor tools
Design Patterns
Visual discourse
Visual style and attractiveness
Engagement
Human factors

Answering these questions and framing the emergent genre of data comics requires:

"Note that this is actually not a data comic, as it does not tell a story about data. It is our homage to Scott McCloud."

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